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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,171	01/19/2006	Mori Nagayama	040302-0540	7246

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EXAMINER	
WANG, EUGENIA	

ART UNIT	PAPER NUMBER
1795	

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12/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/565,171	NAGAYAMA ET AL.
	Examiner	**Art Unit**
	EUGENIA WANG	1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-14,16-18 and 31-43* is/are pending in the application.

4a) Of the above claim(s) *16-18 and 31-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-13* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received November 13, 2008:

a. Claims 1, 3-14, 16-18, and 31-43 are pending with claims 14, 16-18, and 31-43 being withdrawn as to unelected inventions.

b. The previous rejection of record has been withdrawn, as the arguments have been found to be convincing. However, a new rejection has been applied. Thus, the action is non-final.

Claim Objections

2. Claim 13 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 5 and claim 13 present the same limitation (thickness range) and thus are coextensive in scope. Accordingly, claim 13 fails to further limit the subject matter of claim 5.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1 and 3-13 rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0028380 (Tanjo et al.).

As to claim 1, Tanjo et al. teach of a rechargeable lithium battery with a non-aqueous electrolytic solution (abs). As seen in fig. 3, the electrode active material layer

([20A] and [20B]) is formed on collector [30], wherein there is a solid concentration density gradient (of active material [10]) that increases along a thickness from a surface of the active material toward the collector (as the active material [10] is more dense in section [20A], near the collector, than section [20B], away from the collector). It is noted that although the gradient is specifically defined with porosity, this necessarily results in the claimed gradient of the solid active material. This property is exemplified within Tanjo et al., which states that an electrode having a single active material layer of the porosity of 50% and the thickness of 60 μm, and an electrode has both a first active material layer of the porosity of 40% and the thickness of 30 μm closer to the collector and a second active material layer of the porosity of 60% and a thickness of 30 μm closer to the separator have the equal energy density, because the average porosities and amounts of active material of the two electrodes are equal (para 0051, lines 26-36). Accordingly, a gradient, as claimed is taught (as seen in fig. 3) since the two layers have different amounts of the solid concentration of the active material [10].

As to claims 3 and 13, Tanjo et al. teach an active material layer, where the active material layers have different porosities and are layered accordingly (thus creating the laminated thin film layers, wherein the electrode material [10] is different in concentration in the films [20A, 20B]) (para 0051, lines 1-3; fig. 3).

As to claim 4, Tanjo et al. show that the solid concentration is the concentration of an electrode active material ([10], as seen in fig. 3).

As to claim 5, Tanjo et al. teach that the positive electrode has active material, binder, and can also include a conductive substance (para 0035; para 0036, lines 8-12).

Furthermore, example 2 exemplifies an electrode with the structure of fig. 3, wherein it is stated that the positive electrode has the active material, conductive material, and binder mixed in a certain ratio, wherein the solvent is evaporated to leave the pores, thus indicating that the solid electrode active material includes concentrations of an electrode active material, electrically conductive material, and a binder (para 0075, lines 1-14).

As to claim 6, Tanjo et al. teach of an example wherein a two layered active material layer exists, wherein each layer is 30 μm, resulting in an electrode active material layer of 60 μm (para 0075, lines 8-12).

As to claim 7, Tanjo et al. teach of an electrolyte solution which includes a solvent, a viscous fluid (gelling portion of the electrolyte solution), and an electrolyte salt (example 2 teaches of propylene carbonate, dimethyl carbonate, and $LiPF_6$, for each respective element) (para 0039-0040; para 0075, lines 20-22). As previously mentioned, the electrode active material [10] has a higher concentration towards the collector (fig. 3). Accordingly, there is inherently a concentration gradient of electrolyte salt towards the collector (inverse to that of the active material) (seen in fig. 3, wherein there is less electrolyte [50] and thus electrolyte salt towards the current collector). (It is noted that such a concentration gradient as described above necessarily exists, as the electrolyte solution is mixed in a certain ratio, and thus more electrolyte solution applied in one layer yields a greater concentration in that area, and less electrolyte applied the other layer yields a lower concentration in that area. See fig. 3 and example 2 (para 0075, lines 20-22).)

As to claim 8, as stated before, Tanjo et al. teach an active material layer, where the active material layers have different porosities and are layered accordingly (thus creating the laminated thin film layers [20A, 20B]) (para 0051, lines 1-3; fig. 3). Furthermore, as seen in fig. 3, there is more electrolyte (thus electrolyte salt, which is included in the electrolyte) in layer [20B] than in layer [20A], thus depicting differing concentrations.

As to claim 9, Tanjo et al. teach of a rechargeable lithium battery with a non-aqueous electrolytic solution (abs). As seen in fig. 3, the electrode active material layer ([20A] and [20B]) is formed on collector [30]. It can be seen that the electrolyte [50] has a density gradient, wherein it is greater near the separator [50] and less towards he collector [30] (fig. 3). It is noted that the electrolyte solution which includes a solvent, a viscous fluid, and an electrolyte salt (example 2 teaches of propylene carbonate, dimethyl carbonate, and $LiPF_6$, for each respective element) (para 0039-0040; para 0075, lines 20-22). It is noted that the viscous fluid is interpreted to be a gelling portion of the electrolyte solution and would accordingly be seen as a film forming material, as it makes the gel more viscous and more likely to form films, barring specification of what the film forming material is. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22,13 USPQ2d, 1320, 1322 (Fed. Cir. 1989). As previously mentioned, the electrode active material [10] has a higher concentration towards the

collector (fig. 3). Accordingly, there is inherently a concentration gradient of electrolyte (including the viscous/gelling/film forming fluid) towards the collector (inverse to that of the active material) (seen in fig. 3, wherein there is less electrolyte [50] and viscous material towards the current collector). (It is noted that such a concentration gradient as described above necessarily exists, as the electrolyte solution is mixed in a certain ratio, and thus more electrolyte solution applied in one layer yields a greater concentration in that area, and less electrolyte applied the other layer yields a lower concentration in that area. See fig. 3 and example 2 (para 0075, lines 20-22).)

As to claim 10, as stated before, Tanjo et al. teach an active material layer, where the active material layers have different porosities and are layered accordingly (thus creating the laminated thin film layers [20A, 20B]) (para 0051, lines 1-3; fig. 3). Furthermore, as seen in fig. 3, there is more electrolyte (thus viscous/gelling/film forming fluid, which is included in the electrolyte) in layer [20B] than in layer [20A], thus depicting differing concentrations.

As to claim 11, Tanjo et al. teach of a rechargeable lithium battery with a non-aqueous electrolytic solution (abs). As seen in fig. 3, the electrode active material layer ([20A] and [20B]) is formed on collector [30]. It can be seen that the electrolyte [50] has a density gradient, wherein it is greater near the separator [50] and less towards he collector [30] (fig. 3). It is noted that the electrolyte solution which includes a solvent, a viscous fluid, and an electrolyte salt (example 2 teaches of propylene carbonate, dimethyl carbonate, and $LiPF_6$, for each respective element) (para 0039-0040; para 0075, lines 20-22). It is noted that the viscous fluid is interpreted to be a gelling portion

of the electrolyte solution and would accordingly be seen as a film forming material, as it makes the gel more viscous and more likely to form films, barring specification of what the film forming material is. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22,13 USPQ2d, 1320, 1322 (Fed. Cir. 1989). As previously mentioned, the electrode active material [10] has a higher concentration towards the collector (fig. 3). Accordingly, there is inherently a concentration gradient of electrolyte (including the electrolyte salt and viscous/gelling/film forming fluid) towards the collector (inverse to that of the active material) (seen in fig. 3, wherein there is less electrolyte [50] and thus viscous material and electrolyte towards the current collector). (It is noted that such a concentration gradient as described above necessarily exists, as the electrolyte solution is mixed in a certain ratio, and thus more electrolyte solution applied in one layer yields a greater concentration in that area, and less electrolyte applied the other layer yields a lower concentration in that area. See fig. 3 and example 2 (para 0075, lines 20-22).)

As to claim 12, as stated before, Tanjo et al. teach an active material layer, where the active material layers have different porosities and are layered accordingly (thus creating the laminated thin film layers [20A, 20B]) (para 0051, lines 1-3; fig. 3). Furthermore, as seen in fig. 3, there is more electrolyte (thus electrolyte salt and

viscous/gelling/film forming fluid, both included in the electrolyte) in layer [20B] than in layer [20A], thus depicting differing concentrations.

Response to Arguments

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

With respect to the rejections using Yoshida et al. (EP 0858120) have been withdrawn in light of the arguments presented in the November 6, 2008 interview, and thus such arguments are moot. As stated in the interview summary, the reason that the rejection with respect to Yoshida et al. has been withdrawn lies in the fact that Yoshida et al.'s product would not necessarily have the solid concentration gradient as claimed, as, although a gradient of is claimed with respect to the electrolyte and polymethyl methacrylate (decreasing towards the collector), the nature of the active material (solid material) is not indicated. However, a new rejection is applied using Tanjo et al., as set forth above.

Applicant argues that withdrawn claims 14 and 16-18 and 31-43 should be rejoined since (a) claims 31-42 depend from claim 1 and (b) claims 14 and its dependences contain restrictions that are consistent with the recitations of claim 1.

Examiner respectfully disagrees. The reasons for the original requirement were submitted in the action dated April 17, 2007, wherein the reasons for lack of unity were set forth. Such reasons are reiterated for clarity's sake. With respect to (a), the special technical feature is the combination of a composition with a density gradient and its use in a secondary cell (whereas the special technical feature of claim 1 and its dependents

is just a composition with a density gradient). With respect to (b), the special technical feature was originally lacking with originally presented claim 14. However, now claim 14 contains the limitations of previously presented claim 15 and thus includes that special technical feature (previously Group II, species A), wherein the special technical feature lies in the specific method of making a density gradient. It is noted that there was no traversal presented with respect to the original restriction requirement, and traversal at this point would not be timely. For the those reasons above, the restriction requirement is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1795

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795